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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,009	02/20/2002	Mitsuru Uesugi	L9289.02118	4532

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EXAMINER	
AGHDAM, FRESHTEH N	
ART UNIT	**PAPER NUMBER**
2611	

DATE MAILED: 07/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 10/069,009	**Applicant(s)** UESUGI ET AL.	
	Examiner Freshteh N. Aghdam	**Art Unit** 2611	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 06 July 2006 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☐ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☐ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: 14-27.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: see attachment.
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s). _____
13. ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 7/11/2006 have been fully considered but they are not persuasive. Examiner apologizes for the typographical errors in the previous office action. Below, the corrected version of the previous office action is enclosed.

Applicant's Argument(s): Regarding claims 25 and 26, applicant argues that the claimed invention is not taught or suggested by the instant application's disclosed prior art, and further in view of either Uesugi or Yoshida "a plurality of demodulators that demodulate the signal based on regions of demodulation patterns to which signal points of bits belong using the demodulation patterns different between the error detecting units respectively; and a plurality of detectors that perform error detection on the demodulated signal for each of the error detecting units to obtain reception data."

Examiner's Response: Regarding the argument of claims 25-26, both Uesugi and Yoshida teach the limitation that the instant application's disclosed prior art does not teach, wherein a plurality of demodulators that demodulate the signal based on regions of demodulation patterns to which signal points of bits belong using the demodulation patterns different between the error detecting units respectively (Uesugi: Fig. 3B, 5B, and 10B, means 153 and 154; Fig. 10B, means 153, 751-753; Yoshida: Fig. 3, 5, and 9, means 206-209). One of ordinary skill in the art would clearly recognize

that error detecting the demodulated signal is well known in the art and it is performed for enhancing error reduction in the communication system as evidenced by the instant application's disclosed prior art (Fig. 1, means 16).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over the instant application's disclosed prior art, and further in view of Uesugi et al (EP 1 011 245).

As to claims 25 and 26, the instant application's disclosed prior art teaches an adaptive modulation communications system comprising a determiner that determines a modulation level for modulating transmission data (Fig. 1, means 1-2; page 2, lines 1-3); an adder that adds an error detecting bit to the transmission data per predetermined error detecting unit in the transmission data (Fig. 1, means 3; page 2, lines 10-12); transmitting the modulated data to a receiver (Fig. 1, means 9 and 12); and the receiving apparatus comprises a receiver that receives the transmission unit (Fig. 1, means 12); a demodulator that demodulates the received signal, wherein the demodulator uses demodulation patterns that apply to a modulation scheme of a modulation level determined by the determiner (Fig. 1, means 14-1 and 14-2; page 3,

lines 14-25; page 4, lines 1-9); and an error detecting unit coupled to the demodulator (Fig. 1, means 16). The instant application's disclosed prior art does not expressly teach that a modulator that modulates a transmission data with a number of error detecting units in accordance with the modulation level by a modulation scheme corresponding to the modulation level so that a bit position is specific to each of the error detecting units; a plurality of demodulators that demodulate the signal based on regions of demodulation patterns to which signal points of bits belong using the demodulation patterns different between the error detecting units respectively. One of ordinary skill in the art would clearly recognize that transmitting a number of error detecting units (i.e. bits) in accordance with the modulation level and error detecting on the demodulated signal to obtain the transmitted signal is known as Cyclic Redundancy Check (i.e. CRC) coding and is well known in the art and it is performed in order to enhance error reduction and signal estimation in the communications system. Uesugi teaches a plurality of demodulators that demodulate the signal based on regions of demodulation patterns to which signal points of bits belong using the demodulation patterns different between the error detecting units respectively to obtain the transmitted data (Fig. 3B, 5B, and 10B, means 153 and 154; Fig. 10B, means 153, 751-753). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Uesugi with the instant application's disclosed prior art in order to improve transmission efficiency of data by employing a plurality of demodulators that demodulate the received signal based on different demodulation patterns (Abstract).

Claims 21-22 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the instant application's disclosed prior art, and further in view of Yoshida et al (EP 0 944 200).

As to claims 25 and 26-27, the instant application's disclosed prior art teaches an adaptive modulation communications system comprising a determiner that determines a modulation level for modulating transmission data (Fig. 1, means 1-2; page 2, lines 1-3); an adder that adds an error detecting bit to the transmission data per predetermined error detecting unit in the transmission data (Fig. 1, means 3; page 2, lines 10-12); transmitting the modulated data to a receiver (Fig. 1, means 9 and 12); and the receiving apparatus comprises a receiver that receives the transmission unit (Fig. 1, means 12); a demodulator that demodulates the received signal, wherein the demodulator uses demodulation patterns that apply to a modulation scheme of a modulation level determined by the determiner (Fig. 1, means 14-1 and 14-2; page 3, lines 14-25; page 4, lines 1-9); and an error detecting unit coupled to the demodulator (Fig. 1, means 16). The instant application's disclosed prior art does not expressly teach that a modulator that modulates a transmission data with a number of error detecting units in accordance with the modulation level by a modulation scheme corresponding to the modulation level so that a bit position is specific to each of the error detecting units; a plurality of demodulators that demodulate the signal based on regions of demodulation patterns to which signal points of bits belong using the demodulation patterns different between the error detecting units respectively. One of ordinary skill in the art would clearly recognize that transmitting a number of error detecting units (i.e.

bits) in accordance with the modulation level and error detecting on the demodulated signal for each of the error detecting units to obtain the transmitted signal is known as Cyclic Redundancy Check (i.e. CRC) coding and is well known in the art and it is performed in order to enhance error reduction and signal estimation in the communications system. Yoshida teaches a plurality of demodulators that demodulate the signal based on regions of demodulation patterns to which signal points of bits belong (Fig. 5, means 206-209; Par. 96). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Yoshida with the instant application's disclosed prior art in order to perform adaptive modulation in a communications system for which any of a modulation level s can possibly be selected is adapted (Par. 93).

As to claim 21, the instant application's disclosed prior art teaches a detector (Fig. 1, means 16) that performs error detection of a demodulation result in the demodulator per error detectin unit; and a repeat requester (Fig. 1, repeat request signal) that sends a repeat request to the transmitting apparatus according to an error detecting result (Fig. 1, means 16) per error detecting unit (page 3, lines 14-page 4, lines 1-20).

As to claim 22, the instant application's disclosed prior art teaches that the determiner determines the modulation level based on channel quality estimated from the repeat request signal (Fig. 1, means 1-2, 5-6, and 11; page 4, lines 18-page 5, line10).

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the instant application's disclosed prior art and Yoshida, further in view of Sugiyama et al (US 5,862,175).

As to claim 14, the instant application's disclosed prior art teaches that the determiner determines the modulation level (Fig. 1, means 1-2). The instant application's disclosed prior art and Yoshida are silent about the modulation level uses a number having an integer square root. Sugiyama, in the same field of endeavor, teaches a modulation communications system that the modulation scheme is varied among M-ary modulation schemes (n phase shift keying modulation schemes) each with a square root of the number of signal points being an integer (Fig. 1, 2^n multi-level modulation means; Col. 3, lines 5-9). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Sugiyama with the instant application's disclosed prior art and Yoshida in which selectable and flexible modulation of variable order can be performed.

As to claim 15, the instant application's disclosed prior art teaches that the determiner determines the modulation level (Fig. 1, means 1-2). The instant application's disclosed prior art and Yoshida are silent about the modulation level uses a number not having an integer square root. Sugiyama, in the same field of endeavor, teaches a modulation communications system that the modulation scheme is varied among M-ary modulation schemes (n phase shift keying modulation schemes) each with a square root of the number of signal points not being an integer (Fig. 1, 2^n multi-

level modulation means; Col. 3, lines 5-9). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Sugiyama with the instant application's disclosed prior art and Yoshida in which selectable and flexible modulation of variable order can be performed.

Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the instant application's disclosed prior art and Yoshida, further in view of Lee et al (US 6,259,744).

As to claim 16, the instant application's disclosed prior art teaches that the transmitting apparatus comprises a modulator (Fig. 1, means 6-1 and 6-2) that modulates the transmission data at a modulation level determined by the determiner (Fig. 1, means 1, 2, 6-1, and 6-2). The instant application's disclosed prior art and Yoshida are silent about the modulator modulates the transmission data by arranging signal points in such a way that a difference between the number of signal points on the I-axis and Q-axis is small. Lee, in the same field of endeavor, teaches a signal space diagram wherein the number of signal points on the I-axis is the same as the number of signal points on the Q-axis (Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Lee with the instant application's disclosed prior art and Yoshida in order to minimize header decoded BER (i.e. bit error rate) over many channel conditions (Col. 2, Lines 17-19).

As to claims 17 and 18, the instant application's disclosed prior art teaches that the transmitting apparatus comprises a modulator (Fig. 1, means 6-1 and 6-2) that

modulates the transmission data at a modulation level determined by the determiner (Fig. 1, means 1, 2, 6-1, and 6-2). The instant application's disclosed prior art is silent about using a modulation scheme in which a phase direction is identified by an axis that crosses an origin point in a signal space diagram. Lee, in the same field of endeavor, teaches using phase determination axes (Fig. 3, means 54 and 56; Col. 5, Lines 1-12 and 51-53) passing through the origin point in a signal space diagram and computing the closest distance between the symbol and the bit on the decision line (i.e. amplitude identification). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Lee et al with the instant application's disclosed prior art and Yoshida in order to detect error probability of a bit in a symbol (Col. 5, Lines 7 and 8).

As to claim 19, the instant application's disclosed prior art teaches the adder (Fig. 1, means 3) adds the error detecting bit (page 2, lines 10-12); the receiving apparatus further comprises a detector that performs error detection (Fig. 1, means 16) of each demodulation result (Fig. 1, means 14) in the demodulator using the error detection bit; and the detector outputs a bit without an error as an effective bit transmitted from the transmitting apparatus (Fig. 1, means 16). The instant application's disclosed prior art and Yoshida are silent about the error detection unit performs error detection every plurality of bits collectively. One of ordinary skill in the art would clearly recognize that error detecting bit addition every plurality of bits collectively is well known in the art (Cyclic Redundancy Check or CRC) and it is performed in order to enhance error reduction in the communications system.

As to claim 20, the instant application's disclosed prior art and Yoshida teach all the subject matter claimed above, except for the transmitter transmits a pilot signal (training sequence or the second bit decision line) arranged in the middle of a maximum amplitude in a signal space diagram of the modulation scheme. Lee teaches the pilot signal (Fig. 3, decision lines 54 and 56) is arranged in the middle of a maximum amplitude in a signal space diagram of the modulation scheme (column 5, lines 1-10 and 30-32; column 6, lines 47-50). One of ordinary skill in the art would clearly recognize that transmitting pilot signal from a transmitter to a receiver is well known in the art and it is performed for performance characteristic measurements and synchronization. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Lee with the instant application's disclosed prior art and Yoshida in order to greatly improve the reliability of fields that carry the preferred information (column 2, lines 58-60).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Freshteh Aghdam
July 17, 2006

KEVIN BURD
PRIMARY EXAMINER